



Sleep Deprivation, Elective Surgical Procedures, and Informed Consent

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A surgeon on overnight call responds to an 11 p.m. call from the hospital, where a patient has presented with an acute abdomen. After working up the patient for several hours, the surgeon decides

to call in an anesthesiologist and perform a bowel resection. By the time the procedure is completed and the operative note has been dictated, it is time for morning rounds. The surgeon has not slept all night and is scheduled to perform an elective colostomy at 9 a.m. Does the surgeon have an obligation to disclose to the patient the lack of sleep during the past 24 hours and obtain new informed consent? Should the surgeon give the patient the option of postponing the operation or requesting a different surgeon? Should the hospital have allowed the surgeon to schedule an elective procedure following a night he was scheduled to be on call?

Should it allow a surgeon to perform elective surgery after having been awake for more than 24 hours? What potential unintended consequences of disclosing a clinician's sleep deprivation should be considered?

Sleep deprivation adversely affects clinical performance and impairs psychomotor performance as severely as alcohol intoxication.¹ Ensuring that physicians are not fatigued from sleep deprivation is a challenge for medical systems, given competing needs for continuity of care and 24/7 coverage of clinical services. In response to this problem, the Accreditation Council for Graduate Medical Education has re-

vised its regulations regarding residents' work hours to restrict trainees who are in their first postgraduate year to a maximum of 16 hours of continuous work followed by a minimum of 8 hours off duty.² No such regulations exist for fully trained physicians.

Performance of elective surgery in a new patient despite sleep deprivation from work with other patients cannot be rationalized on the basis of a continuity-of-care argument. Moreover, this is an area of clinical practice that may be amenable to policies aimed at improving patient safety by reducing the adverse effects of sleep deprivation.

Fatigue from sleep deficiency may be due to the loss of one night's sleep, chronic insufficient sleep, repeated interruptions of sleep, or misalignment of the circadian phase — which may be attributable to long work shifts,

Forces That Oppose the Rescheduling of Elective Surgery.	
Interested Party	Obstacles
Patient	Already made psychological and logistic provisions for the procedure on a particular day; may be difficult to reschedule with same provider in a timely manner
Clinician	May lose income, encumber schedule, lose privacy, lose cases to colleagues, lose power
Department	May lose income if procedures are not performed; rescheduling a last-minute cancellation in a timely manner is challenging
Institution	May have hiatus in schedule if procedures are canceled; may lose money; patients may seek care elsewhere if a procedure cannot be rescheduled in a timely manner
Health care system	Accumulated fixed costs of unused operating-room time and rescheduling procedures at multiple institutions may increase health care costs
Other hospital departments, staff members, and other patients	Rescheduling and cancellations may have downstream scheduling consequences; resources reserved for a patient whose procedure is canceled may have already been denied to other patients

long workweeks, a sleep disorder, or personal circumstances. Researchers have documented the adverse effects of sleep deprivation and sleep disorders on individual performance.¹ In surgery, there is an 83% increase in the risk of complications (e.g., massive hemorrhage, organ injury, or wound failure) in patients who undergo elective daytime surgical procedures performed by attending surgeons who had less than a 6-hour opportunity for sleep between procedures during a previous on-call night.³

Policies should take into account the circumstances that may lead to acute sleep deprivation before scheduled elective surgery. For example, a surgeon who is intermittently scheduled for overnight emergency call for a busy group practice or hospital will probably be awake much of the night. Alternatively, a surgeon who practices in a rural area and always carries a pager may only occasionally have to perform surgery in an emergency, such as a

motor vehicle crash. Some institutions already have policies prohibiting physicians who cover busy practices from scheduling elective procedures on post-call days, thereby avoiding the first scenario. Such prohibitions should be standard practice. Policies that facilitate timely rescheduling of elective procedures or at least require that informed consent be obtained again under such circumstances may address the second scenario.

Unlike other practice areas, elective surgery is potentially amenable to rescheduling, although many competing interests influence that possibility, even when all parties stand to gain by avoiding errors and complications and improving outcomes (see table). When no policy exists to facilitate rescheduling or to prohibit sleep-deprived physicians from working, the burden of deciding to proceed with the operation or reschedule it largely falls to the treating clinician, who faces competing interests and may

choose not to inform patients or engage them in the decision-making process.

Surveys indicate that most patients would be concerned about their safety if they knew that their doctor had been awake for 24 hours and would want to be informed of sleep deprivation; 80% say they would request a different provider in such circumstances.⁴ Given the data on sleep deprivation, the associated risk of surgical complications, and patient preferences, we believe that hospitals should prohibit the performance of elective surgical procedures when an attending surgeon or anesthesiologist is acutely sleep-deprived — and should ensure priority rescheduling of the canceled surgery.

As a first step, we recommend that institutions implement policies to minimize the likelihood of sleep deprivation before a clinician performs elective surgery and to facilitate priority rescheduling of elective procedures when a clinician is sleep-deprived. In addition, patients should be empowered to inquire about the amount of sleep their clinicians have had the night before such procedures.

The Sleep Research Society (SRS) has endorsed model legislation that would require physicians who have been awake for 22 of the previous 24 hours to “inform their patients of the extent and potential safety impact of their sleep deprivation and to obtain consent from such patients prior to providing clinical care or performing any medical or surgical procedures.” The American Academy of Sleep Medicine and the SRS have also endorsed model drowsy-driving legislation stipulating that the functioning of a

person who has been awake for more than 22 of the previous 24 hours is impaired by sleep deprivation (www.sleepresearchsociety.org/GovernmentAffairs.aspx).

Chronic sleep deprivation degrades one's ability to recognize the impairments induced by sleep loss.⁵ Sleep-deprived clinicians are therefore not likely to assess accurately the risks posed when they perform procedures in such a state, and they should not be permitted to decide whether or not to proceed with elective surgery without obtaining the patient's informed consent. In keeping with the ethical and legal standards of informed consent, patients awaiting a scheduled elective surgery should be explicitly informed about possible impairments induced by sleep deprivation and the increased risk of complications. They should then be given the choice of proceeding with the surgery, rescheduling it, or proceeding with a different physician. If patients decide to proceed, they should explicitly consent to do so — in writing, on the day of the procedure, in front of a witness, and ideally on a standardized form designed for this purpose.

This approach would represent a fundamental shift in the responsibility patients are asked

to assume in making decisions about their own care and might prove burdensome to patients and physicians and damaging to the patient-physician relationship. Yet this shift may be necessary until institutions take responsibility for ensuring that patients rarely face such dilemmas. Although it may be challenging to assess sleep deprivation, estimate the risk of resulting harm, and enforce a formal sleep policy that necessitates the disclosure of clinicians' personal information, we believe that the benefit of creating such a policy outweighs the burden. To implement such policies, institutions will need to absorb the financial and administrative consequences of canceling and rescheduling elective surgeries in a timely manner. But these steps might ultimately reduce institutional costs if outcomes are improved and complications reduced.

The problem of sleep deprivation vexes medical practice. Public debate and creative solutions are needed to ensure that patients' interests are protected. We believe that elective surgeries provide an opportunity to create and evaluate a policy designed to avert the adverse effects of sleep deprivation on patient outcomes. Strategies learned from applying

such policies can then inform other areas of practice.

Dr. Czeisler is a former president of the Sleep Research Society (SRS) and a member of both the American Academy of Sleep Medicine and the SRS.

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

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Editor's note: A related letter to the Editor from the American College of Surgeons appears in this issue (pages 2672–2673).

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Physicians versus Hospitals as Leaders of Accountable Care Organizations

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Enactment of the Affordable Care Act (ACA) was a historic event. Along with the Recovery Act, the ACA will usher in the most extensive changes in the U.S. health care system since the creation of Medicare and Medicaid.

Under this law, the next few years will be a period of what economists call “creative destruction”: our fragmented, fee-for-service health care delivery system will be transformed into a higher-quality, higher-productivity sys-

tem with strong incentives for efficient, coordinated care.¹ Consequently, the actions of physicians and hospitals during this period will determine the structure of the delivery system for many years. The implications will